

What is claimed is:

1. A method of fabricating a MOSFET comprising:

forming a polysilicon gate electrode on a semiconductor substrate;

forming a first doping layer on an area of the semiconductor substrate,
the area including the polysilicon gate electrode;

implanting dopant into the first doping layer by means of a high-tilt
angle pocket ion implantation;

forming LDD regions on a surface of the semiconductor substrate at
two sides of the polysilicon gate electrode by diffusing the dopant of the first doping
layer into the semiconductor substrate;

forming an insulating layer on the first doping layer by diffusing the
dopant of the first doping layer into the semiconductor substrate;

forming a spacer by etching the insulating layer and the first doping
layer;

forming a second doping layer on the semiconductor substrate and the
polysilicon gate electrode with the spacer; and

forming a source region and a drain region on the surface of the
semiconductor substrate at both sides of the polysilicon gate electrode with the spacer
by conducting a thermal treatment process so that the dopant of the second doping
layer can be diffused into the semiconductor substrate.
2. A method as defined in claim 1, wherein said semiconductor substrate
comprises Si, GaAs or silicon-on-insulator.

3. A method as defined in claim 1, wherein the first doping layer comprises silicated glass with dopant.
4. A method as defined in claim 1, wherein the dopant comprises B, BF₂, P, As or N.
5. A method as defined in claim 1, wherein the pocket ion implantation is performed with an angle between 5° and 45°.
6. A method as defined in claim 1, wherein the spacer has a thickness between 50 Å and 500 Å.
7. A method as defined in claim 1, wherein the second doping layer comprises a doped oxide layer and the second doping layer is formed by means of a plasma enhanced chemical vapor deposition process.
8. A method as defined in claim 1, wherein the second doping layer has a thickness between 100 Å and 1000 Å.
9. A method as defined in claim 1, wherein the thermal treatment process comprises a rapid thermal process.
10. A method as defined in claim 9, wherein the thermal treatment is performed at temperature between 950 °C and 1150 °C for 3 to 20 seconds.